Water Quality NewsFlash

Published by California Department of Transportation, Division of Environmental Analysis, Office of Storm Water Policy

August 29, 2005 ***Number 05-35***

Bacteria on the Coasts – *Beach sand may be a source* – Increased testing of beach waters has shown that many California beaches have bacteria concentrations above water quality standards. While some bacteria are pathogenic (disease-causing), the bacteria counts are generally used as "indicators" of the potential for human pathogens in the waterway including viruses and parasites. Many of these waterways with elevated bacteria levels are listed on the 303(d) list as impaired and *total maximum daily loads* (TMDLs) are either in preparation or will be prepared with the goal of reducing the bacteria concentrations. TMDL implementation is potentially very costly since reducing the bacteria load in stormwater may require that the stormwater be collected and directed to a treatment facility that includes disinfection processes.

Recent studies in California have shown that shoreline organic debris and the sand itself may harbor bacteria or even act as a bacteria incubator. Several studies of bacteria DNA have shown that in many locations, the main source of bacteria is birds (see *NewsFlash 05-18*). During the high tide, these bacteria apparently can be picked up and carried into the water, increasing bacteria levels. An evaluation of data from 60 southern California marine beaches concluded that bacteria concentrations during spring (i.e., strong) tides were significantly higher than those during neap (weak) tides at 50 of the beaches. In addition, the shoreline water was twice as likely to exceed standards during the spring tides. Posted: http://www.stanford.edu/~aboehm/es048175m.pdf

Studies elsewhere in the U.S. have shown that indicator bacteria can be more highly concentrated in beach sand than in the adjacent waterway. Consequently, the Clean Beaches Council has propose research to determine the relationship between bacteria in the sand and the health of beach-goers. http://www.cleanbeaches.org/mediacenter/

This new information regarding bacteria in the sand may affect how epidemiological studies are conducted to assess the health impacts of bacteria in waterways. In some studies the swimming-associated illness rate is determined by subtracting the gastrointestinal illness rate in nonswimmers from that for swimmers. Typically the beachgoers are contacted several days after their visit to the shoreline. The "net" increase in illness is then compared with waterway bacteria levels. This approach may be inappropriate if the nonswimmers themselves have a significant bacteria exposure. This new information may also help explain anomalous data from earlier epidemiological studies in which the gastrointestinal illness rate for nonswimming children at the beach was sometimes significantly higher than that for children who swam.

Training – *Materials available from Caltrans, other sources* – The Caltrans internet site includes copies of training course materials from the Construction Stormwater Training Program developed for Caltrans staff and construction contractors. Also listed are courses and training materials developed by others including videos from the State Water Resources Control Board. http://www.dot.ca.gov/hq/construc/stormwater/swppp_training.html

WQ NewsFlash is a weekly update of storm water and related news for the Department. *Verify information before taking action on these bulletins*. Contact Betty Sanchez, Betty_Sanchez@dot.ca.gov (916) 653-2115, or Fred Krieger, (510) 843-7889, fkrieger@msn.com with questions or to be added or deleted from e-mail list. Posted online at: http://www.dot.ca.gov/hq/env/stormwater/publicat/newsflash/index.htm